## SEQUENCE LISTING

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<213> Neisseria meningitidis

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| accaaagtta | tttatgaaga | gcaaattcaa | gagcaagcaa | caggeteteg | acagcttgcc | 240  |
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| gggcaaacca | tgcacggtcg | tcaagtgcaa | tttttgttaa | atggcgtgcc | tttgacaggt | 360  |
| tcgcgagaca | tctctagaca | gcttaatagt | atcaatccca | atcaagtggc | tagaattgaa | 420  |
| gttttatcag | gagcaaccag | tatttatggg | tctggagcaa | caggcggttt | gattaatatc | 480  |
| gttactaagt | ctgatttgga | agaggagcaa | tttgaaaccc | gcatcggtgt | acatggtagt | 540  |
| aaattatcca | gtgaaggtat | cggttatcag | gtaggtcaga | gtgtagcagġ | tgtcagcgaa | 600  |
| aatggtaatg | tccttgcacg | acttgatgtc | gactatcgca | ccacaggagg | ggcatttgat | 660  |
| gctaacggta | aacgcatcgc | tcctgagcct | gcccaaactg | ataagcaaga | cagcaaaagc | 720  |
| ctaagtgtca | atacaaatgt | tgattggcaa | cttgacgaca | agcaaaatat | caatctggca | 780  |
| ttgacgcatt | ataacgacaa | acaagatacc | gattatgcac | ctgattatgg | taatcgcctt | 840  |
| gcggtgttgt | ttggagaaaa | gccttcatta | aatgccatca | aaggcttatc | attatcagaa | 900  |
| cagccaaaaa | ccaccaaaag | cacctttaat | atcaactatc | atcatgatga | tttgtggggt | 960  |
| aacaccatca | ataccaatgc | ttattatcgc | agagagaaag | gcagatttta | tccctttgtt | 1020 |
| gccccgtttt | cgatcgccaa | agccctgcct | attttacaaa | gcatgaattt | gccatcagcc | 1080 |
| actttggatg | cttataccaa | ggctccacaa | gctcgcgcct | atggggtgtt | acaatccgaa | 1140 |
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<213> Neisseria meningitidis

WO 00/43519 PCT/EP00/00428

<400> 2

| Me<br>1          | t Ar  | g H   | is         | Sei          | r Hi:<br>5 | з Ту   | r Ph    | e Gl       | n Tr             |      | ı Sei   | Leu   | ı Pro  | Let        | ı Leı     | ı Ser      |
|------------------|-------|-------|------------|--------------|------------|--------|---------|------------|------------------|------|---------|-------|--------|------------|-----------|------------|
|                  |       | ~ 17  | - 1        | m'           |            | - 01   | _       | _          |                  | 10   |         |       |        |            | 15        |            |
|                  |       |       |            | 20           |            |        |         |            | 25               |      |         |       |        | 30         |           | ı Pro      |
| Th               | r Va  | 1 G   | lu         | Let          | Glu        | ı Pro  | Va.     | l Vai      | l Ile            | Thr  | : Ile   | Asp   | Lvs    | Sei        | Glv       | / Met      |
|                  |       | 3     |            |              |            |        |         | 40         |                  |      |         |       | 45     |            | . 01)     | 11.00      |
| Al.              | a Le  | u A   | la         | Asn          | Arc        | ılı    | Thi     | Glr        | ı Met            | Pro  | His     | ጥከ፦   |        |            |           | . Ile      |
|                  | 50    |       |            |              |            |        | 55      |            |                  |      |         | 60    |        |            |           |            |
| ту               | r Gl  | u G   | lu         | Gln          | Ile        | Glr    | ı Glu   | ı Glr      | a Ala            | Thr  | Gly     | Ser   | Arg    | Glr        | Leu       | Ala        |
| 65               |       |       |            |              |            | 70     |         |            |                  |      | 75      |       |        |            |           | 80         |
| Ası              | o Va  | l Me  | et         | Ala          | Glr        | Leu    | ıle     | Pro        | Ser              | Leu  | Gly     | Val   | Ser    | Ser        | Glv       | Thr        |
|                  |       |       |            |              | 85         |        |         |            |                  | 90   |         |       |        |            | 95        |            |
| Thi              | : Se  | r As  | sn         | Phe          | Gly        | Gir    | Thr     | Met        | His              | Glv  | Ara     | Gln   | Val    | Gln        |           | Leu        |
|                  |       |       |            | 100          |            |        |         |            | 105              |      | • • • • | 02    |        | 110        |           | neu        |
| Let              | ı Ası | n Gl  | Ly         | Val          | Pro        | Leu    | Thr     | GI v       |                  |      | Acn     | T10   | e      |            |           | Leu        |
|                  |       | 11    | .5         |              |            |        |         | 120        |                  | nig  | vab     | TTE   |        | Arg        | GIN       | Leu        |
| Asr              | . Sei |       |            | Asn          | Pro        | λεη    | C1 n    |            |                  |      |         |       | 125    |            |           |            |
|                  | 130   | ·     |            |              | 110        | ASII   |         | vaı        | Ala              | Arg  | TTE     |       | Val    | Leu        | Ser       | Gly        |
| 7 1 <del>-</del> |       |       |            | <b>7</b> 1 - | <b></b>    |        | 135     |            |                  |      |         | 140   |        |            |           |            |
| 145              | 1111  | . 56  | : L        | тте          | Tyr        |        |         | Gly        | Ala              | Thr  | Gly     | Gly   | Leu    | Ile        | Asn       | Ile        |
| 145              |       |       |            |              |            | 150    |         |            |                  |      | 155     |       |        |            |           | 160        |
| Val              | Thr   | Ly    | s :        | Ser          | Asp        | Leu    | Glu     | Glu        | Glu              | Gln  | Phe     | Glu   | Thr    | Arg        | Ile       | Gly        |
|                  |       |       |            |              | 165        |        |         |            |                  | 170  |         |       |        |            | 175       |            |
| Val              | His   | G1    | у          | Ser          | Lys        | Leu    | Ser     | Ser        | Glu              | Gly  | Ile     | Gly   | Tyr    | Gln        | Val       | Glv        |
|                  |       |       | 3          | 180          |            |        |         |            | 185              |      |         | _     | -      | 190        |           | 3          |
| Gln              | Ser   | Va    | 1 2        | Ala          | Gly        | Val    | Ser     | Glu        | Asn              | Glv  | Asn     | Val   | Leu    |            | Ara       | Lan        |
|                  |       | 19    | 5          |              |            |        |         | 200        |                  |      |         |       | 205    | 1114       | ALY       | nea        |
| Asp              | Val   | As    | ľ q        | rvr          | Ara        | Thr    | Thr     |            | Glv              | Δla  | Dho     | Asp   |        | B          | <b>61</b> | _          |
|                  | 210   |       |            | -            | ,          |        | 215     | 1          | O. J             |      | rne     |       | мта    | ASI        | сту       | rys        |
| Ara              | Ile   | Al.   | a F        | ro           | Glu        | Pro    |         | C1-        | mh               |      | _       | 220   | _      |            |           |            |
| 225              |       |       |            |              | <b>014</b> | 230    | n1a     | GIII       | 1111             | ASp  |         | Gln   | Asp    | Ser        | Lys       | Ser        |
|                  | Sar   | Wa.   | 1 74       |              | m>         |        |         |            | _                |      | 235     |       |        |            |           | 240        |
| Deu              | ser   | va.   | I A        | sn           | Thr        | Asn    | Val     | Asp        | Trp              | Gln  | Leu     | Asp   | Asp    | Lys        | Gln       | Asn        |
| - 1              | _     |       |            |              | 245        |        |         |            |                  | 250  |         |       |        |            | 255       |            |
| TTE              | Asn   | Le    | ιA         | la           | Leu        | Thr    | His     | Tyr        | Asn              | Asp  | Lys     | Gln   | Asp    | Thr        | Asp       | Tyr        |
|                  |       |       | _          | 60           |            |        |         |            | 265              |      |         |       |        | 270        |           |            |
| Ala              | Pro   | Ası   | тс         | yr           | Gly        | Asn    | Arg     | Leu        | Ala              | Val  | Leu     | Phe   | Gly    | Glu        | Lys       | Pro        |
|                  |       | 275   |            |              |            |        |         | 280        |                  |      |         |       | 285    |            | _         |            |
| Ser              | Leu   | Asr   | ı A        | la           | Ile        | Lys    | Gly     | Leu        | Ser              | Leu  | Ser     | Glu   |        | Pro        | Lvs       | Thr        |
|                  | 290   |       |            |              |            |        | 295     |            |                  |      |         | 300   |        |            | 2,5       |            |
| Thr              | Lys   | Ser   | т          | hr           | Phe        | Asn    | Ile     | Asn        | Tvr              | Hie  |         | Asp A | 7.00   | t a        | m         | <b>~</b> 1 |
| 305              |       |       |            |              |            | 310    |         |            | - , -            |      | 315     | uah , | vəh    | ren        |           |            |
| Asn              | Thr   | IJe   | Δ <u>ε</u> | sn '         | Thr        |        | ءΙ۵     | <b>ጥ</b> ፡ | <b>ጥ</b> • • • • |      |         | Glu : |        | <b>.</b> . | _         | 320        |
|                  |       |       |            |              | 325        | - 1 11 | • 1 = 0 | - y L      |                  |      | AIG     | JIU . | ьys    |            |           | Phe        |
| Tur              | Dro   | Dh-   | ,          |              |            | F      | D.L     | _          |                  | 330  |         |       |        |            | 335       |            |
| - y -            | 0     | E 116 |            |              | мта        | LIO    | rue     |            |                  | Ala  | Lys .   | Ala i | Leu    | Pro        | Ile       | Leu        |
| 61               |       |       |            | 40           | _          |        |         |            | 345              |      |         |       |        | 350        |           |            |
| $\alpha_{TD}$    | ser   | met   | . A:       | sn :         | Leu        | Pro    | Ser     | Ala        | Thr              | T.eu | Aen :   | 112   | Pres C | n 14       | T         | 7. 1 -     |

355 360 365

Pro Gln Ala Arg Ala Tyr Gly Val Leu Gln Ser Glu Ser Lys Ala Glu
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Val Leu Gly Arg Val Pro Asn Leu Asn Lys Pro Lys Arg Ala Leu Phe
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| tccgcacaat | ggcccctgac | gcgcaacctg | tcggccgtcg | tccgttacaa | ctacggtttt | 2160 |
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| gaagccaaaa | aaccgataga | ggtgctggcg | ggtgcggaat | acaaaagcag | ttgcggctgc | 2220 |
| tggggcgcgg | gcgtgtacgc | ccaacgctac | gttaccggcg | aaaacaccta | caaaaacgct | 2280 |
| gtctttttct | cacttcagtt | gaaagacctc | agcagtgtcg | gcagaaaccc | cgcagacagg | 2340 |
| atggatgtcg | ccgttcccgg | ctatatcccc | gcccactctc | tttccgccgg | acgcaacaaa | 2400 |
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<213> Neisseria meningitidis

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| Met | Ala | Arg  | Leu | Phe | Ser | Leu | Lys | Pro | Leu | Val | Leu | Ala | Leu | Gly | Phe |
| 1   | Ť   | •    |     | 5   |     |     | •   |     | 10  |     |     |     |     | 15  |     |
| Cys | Phe | Gly  | Thr | His | Cys | Ala | Ala | Ala | Asp | Ala | Val | Ala | Ala | Glu | Glu |
|     |     |      | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Thr | Asp | Asn  | Pro | Thr | Ala | Gly | Gly | Ser | Val | Arg | Ser | Val | Ser | Glu | Pro |
|     |     | 35   |     |     |     |     | 40  |     |     | -   |     | 45  |     |     |     |
| Met | Gln | Pro  | Ala | Gly | Leu | Ser | Leu | Gly | Ser | Thr | Cys | Leu | Phe | Cvs | Ser |
|     | 50  |      |     |     |     | 55  |     | _   |     |     | 60  |     |     | -   |     |
| Asn | Glu | Ser  | Gly | Lys | Pro | Glu | Lys | Thr | Glu | Ser | Ala | Val | Lys | Glv | Ser |
| 65  |     |      |     |     | 70  |     |     |     |     | 75  |     |     | -   | •   | 80  |
| Gly | Glu | Gly  | Pro | Val | Pro | Glu | Asn | His | Thr | Arg | Ile | Val | Ala | Asp | Lys |
|     |     |      |     | 85  |     |     |     |     | 90  | _   |     |     |     | 95  | -   |
| Val | Glu | Gly  | Gln | Ser | Gln | Val | Lys | Val | Arg | Ala | Glu | Gly | Gly | Val | Val |
|     |     |      | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Val | Glu | Arg  | Asn | Arg | Thr | Thr | Leu | Asn | Ala | Asp | Trp | Ala | Asp | Tyr | Asp |
|     |     | 115  |     |     |     |     | 120 |     |     |     |     | 125 |     | _   | _   |
| Gln | Ser | Gly  | Asp | Thr | Val | Thr | Val | Gly | Asp | Arg | Phe | Ala | Leu | Gln | Gln |
|     | 130 |      |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Asp | Gly | Thr  | Leu | Ile | Arg | Gly | Glu | Thr | Leu | Thr | Tyr | Asn | Leu | Glu | Gln |
| 145 |     |      |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Gln | Thr | Gly  | Glu | Ala | His | Asn | Val | Arg | Met | Glu | Thr | Glu | Gln | Gly | Gly |
|     |     |      |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Arg | Arg | Leu  | Gln | Ser | Val | Ser | Arg | Thr | Ala | Glu | Met | Leu | Gly | Glu | Gly |
|     |     |      | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| His | Tyr | Lys  | Leu | Thr | Glu | Thr | Gln | Phe | Asn | Thr | Cys | Ser | Ala | Gly | Asp |
|     |     | 195  |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ala | Gly | Trp  | Tyr | Val | Lys | Ala | Ala | Ser | Val | Glu | Ala | Asp | Arg | Glu | Lys |
|     | 210 |      |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Gly | Ile | Gly  | Val | Ala | Lys | His | Ala | Ala | Phe | Val | Phe | Gly | Gly | Val | Pro |
| 225 |     |      |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Ile | Phe | Tyr  | Thr | Pro | qıT | Ala | Asp | Phe | Pro | Leu | Asp | Gly | Asn | Arg | Lys |
|     |     |      |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ser | Gly | Leu  | Leu | Val | Pro | Ser | Leu | Ser | Ala | Gly | Ser | Asp | Gly | Val | Ser |
|     |     |      | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
|     |     |      |     |     |     |     |     |     |     |     |     |     |     |     |     |

Leu Ser Val Pro Tyr Tyr Phe Asn Leu Ala Pro Asn Leu Asp Ala Thr 275 280 Phe Ala Pro Ser Val Ile Gly Glu Arg Gly Ala Val Phe Asp Gly Gln 295 300 Val Arg Tyr Leu Arg Pro Asp Tyr Ala Gly Gln Ser Asp Leu Thr Trp 310 315 Leu Pro His Asp Lys Lys Ser Gly Arg Asn Asn Arg Tyr Gln Ala Lys 325 330 Trp Gln His Arg His Asp Ile Ser Asp Thr Leu Gln Ala Gly Val Asp 345 Phe Asn Gln Val Ser Asp Ser Gly Tyr Tyr Arg Asp Phe Tyr Gly Asn 360 Lys Glu Ile Ala Gly Asn Val Asn Leu Asn Arg Arg Val Trp Leu Asp 375 Tyr Gly Gly Arg Ala Ala Gly Gly Ser Leu Asn Ala Gly Leu Ser Val 390 Leu Lys Tyr Gln Thr Leu Ala Asn Gln Ser Gly Tyr Lys Asp Lys Pro 405 410 Tyr Ala Leu Met Pro Arg Leu Ser Ala Asp Trp Arg Lys Asn Thr Gly 425 Arg Ala Gln Ile Gly Val Ser Ala Gln Phe Thr Arg Phe Ser His Asp 440 Ser Arg Gln Asp Gly Ser Arg Leu Val Val Tyr Pro Asp Ile Lys Trp 455 Asp Phe Ser Asn Ser Trp Gly Tyr Val Arg Pro Lys Leu Gly Leu His 470 475 Ala Thr Tyr Tyr Ser Leu Asn Arg Phe Gly Ser Gln Glu Ala Arg Arg 485 490 Val Ser Arg Thr Leu Pro Ile Val Asn Ile Asp Ser Gly Met Thr Phe 500 505 Glu Arg Asn Thr Arg Met Phe Gly Gly Glu Val Leu Gln Thr Leu Glu 520 Pro Arg Leu Phe Tyr Asn Tyr Ile Pro Ala Lys Ser Gln Asn Asp Leu 535 540 Pro Asn Phe Asp Ser Ser Glu Ser Ser Phe Gly Tyr Gly Gln Leu Phe 550 555 Arg Glu Asn Leu Tyr Tyr Gly Asn Asp Arg. Ile Asn Thr Ala Asn Ser 565 570 Leu Ser Ala Ala Val Gln Ser Arg Ile Leu Asp Gly Ala Thr Gly Ala 585 Glu Arg Phe Arg Ala Gly Ile Gly Gln Lys Phe Tyr Phe Lys Asn Asp 600 Ala Val Met Leu Asp Gly Ser Val Gly Lys Lys Pro Arg Ser Arg Ser 615 Asp Trp Val Ala Phe Ala Ser Ser Gly Ile Gly Ser Arg Phe Ile Leu 625 630 635 Asp Ser Ser Ile His Tyr Asn Gln Asn Asp Lys Arg Ala Glu Asn Tyr

|     |     |     |     | 645 |     |     |     |     | 650 |     |     |     |     | 655 |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Val | Gly | Ala | Ser | Tyr | Arg | Pro | Ala | Gln | Gly | Lys | Val | Leu | Asn | Ala |
|     |     |     | 660 |     |     |     |     | 665 |     |     |     |     | 670 |     |     |
| Arg | Tyr | Lys | Tyr | Gly | Arg | Asn | Glu | Lys | Ile | Tyr | Leu | Lys | Ser | Asp | Gly |
|     |     | 675 |     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |
| Ser | Tyr | Phe | Tyr | Asp | Lys | Leu | Ser | Gln | Leu | Asp | Leu | Ser | Ala | Gln | Trp |
|     | 690 |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |
| Pro | Leu | Thr | Arg | Asn | Leu | Ser | Ala | Val | Val | Arg | Tyr | Asn | Tyr | Gly | Phe |
| 705 |     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |
| Glu | Ala | Lys | Lys | Pro | Ile | Glu | Val | Leu | Ala | Gly | Ala | Glu | Tyr | Lys | Ser |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |     |
| Ser | Суs | Gly | Cys | Trp | Gly | Ala | Gly | Val | Tyr | Ala | Gln | Arg | Tyr | Val | Thr |
|     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |     |     |
| Gly | Glu | Asn | Thr | Tyr | Lys | Asn | Ala | Val | Phe | Phe | Ser | Leu | Gln | Leu | Lys |
|     |     | 755 |     |     | -   |     | 760 | -   |     |     |     | 765 |     |     |     |
| Asp | Leu | Ser | Ser | Val | Gly | Arg | Asn | Pro | Ala | Asp | Arg | Met | Asp | Val | Ala |
|     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |     |     |     |     |
| Val | Pro | Gly | Tyr | Ile | Pro | Ala | His | Ser | Leu | Ser | Ala | Gly | Arg | Asn | Lys |
| 785 |     |     |     |     | 790 |     |     |     |     | 795 |     |     | _   |     | 800 |
| Arg | Pro |     |     |     |     |     |     |     |     |     |     |     | ,   |     |     |
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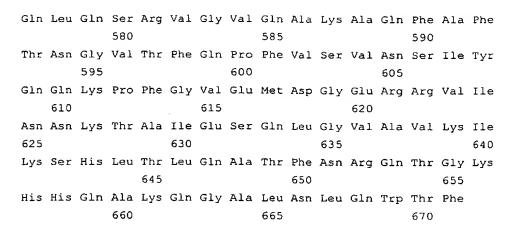


<210> 6
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<212> PRT
<213> Neisseria meningitidis

<400> 6

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|      |     | 195 |     |     |      |       | 200 |     |     |      |       | 205 |            |     |     |
|------|-----|-----|-----|-----|------|-------|-----|-----|-----|------|-------|-----|------------|-----|-----|
| Leu  | Ser | Leu | Asp | Val | Asp  | Asn   | Ser | His | Val | Ile  | Gly   |     | Thr        | Ile | Asp |
|      | 210 |     |     |     |      | 215   |     |     |     |      | 220   |     |            |     | •   |
| Leu  | Gly | Ala | Leu | Glu | Leu  | Thr   | Asn | Ser | Leu | Trp  | Glu   | Pro | Arg        | Trp | Asn |
| 225  |     |     |     |     | 230  |       |     |     |     | 235  |       |     |            |     | 240 |
| Ser  | Asn | Ile | Asp | Tyr | Leu  | Ile   | Thr | Lys | Asn | Ala  | Glu   | Ile | Arg        | Phe | Asn |
|      |     |     |     | 245 | •    |       |     |     | 250 |      |       |     |            | 255 |     |
| Thr  | Lys | Ser | Glu | Ser | Leu  | Leu   | Val | Lys | Glu | Asp  | Tyr   | Ala | Gly        | Gly | Ala |
|      |     |     | 260 |     |      |       |     | 265 |     |      |       |     | 270        |     |     |
| Arg  | Phe | Arg | Phe | Ala | Tyr  | Gly   | Leu | Lys | Asp | Lys  | Val   | Pro | Glu        | Thr | Pro |
|      |     | 275 |     |     |      |       | 280 |     |     |      |       | 285 |            |     |     |
| Ile  | Leu | Thr | Phe | Ģlu | Lys  | Asn   | Ile | Thr | Gly | Thr  | Ser   | Asp | Ile        | Ile | Phe |
|      | 290 |     |     | •   |      | 295   |     |     |     |      | 300   |     |            |     |     |
|      | Gly | Lys | Ala | Leu | Asp  | Asn   | Leu | Lys | His | Leu  | Asp   | Gly | His        | Gln | Ile |
| 305  |     |     |     |     | 310  |       |     |     |     | 315  |       |     | •          |     | 320 |
| Ile  | Lys | Val | Asn |     | Thr  | Ala   | Asp | Lys | His | Ala  | Phe   | Arg | Leu        | Ser | GJA |
|      |     |     |     | 325 |      |       |     |     | 330 |      |       |     |            | 335 |     |
| Lys  | His | Gln |     | Gly | Ile  | Tyr   | Thr |     | Ser | Leu  | Gln   | Gln | Arg        | Pro | Glu |
|      |     |     | 340 | _   |      |       |     | 345 |     |      |       |     | 350        |     |     |
| Gly  | Phe |     | Thr | Lys | Val  | Gln   |     | Arg | Asp | Asp  | Ile   |     | Ile        | Tyr | Ala |
| G1 - | G1- | 355 | G1  |     |      | _     | 360 | _   | _,  |      | _     | 365 |            |     |     |
| GIN  | Gln | Ala | GIN | Ala | Ala  |       | Thr | Leu | Phe | Ala  |       | Arg | Leu        | Asn | Asp |
| T    | 370 | C   | 7   | T1. | Db = | 375   | N   | m   | •   |      | 380   | _   | - 1        | _   | _   |
| 385  | Asn | ser | ASP | тте | 390  | Asp   | Arg | Thr | Leu |      | Arg   | Lys | GIY        | Leu |     |
|      | Arg | Wal | Tle | Λen |      | u i e | 505 | 50× | C15 | 395  | U = 1 | C1- | <i>C</i> 1 | T   | 400 |
| пец  | ALG | vai | 116 | 405 | Gly  | птэ   | Ser | Ser | 410 | ιιþ  | var   | GIN | GIĀ        | 415 | THE |
| Ala  | Pro | Val | Glu |     | Asn  | Ara   | Lvs | Glv |     | Gln  | Len   | Glv | Gly        |     | Val |
|      |     |     | 420 | 0-1 |      | 9     | -,0 | 425 |     | 0111 | beu   | ULY | 430        | ռոր | Val |
| Phe  | Ser | Leu |     | Asn | His  | Asn   | Tvr |     | Leu | Ser  | Va1   | Glv |            | Met | Glv |
|      |     | 435 |     |     |      |       | 440 |     |     |      |       | 445 |            |     | 1   |
| Gly  | Gln | Ala | Glu | Gln | Arg  | Ser   | Thr | Phe | Arg | Asn  | Pro   | Asp | Thr        | Asp | Asn |
|      | 450 |     |     |     |      | 455   |     |     |     |      | 460   | -   |            | •   |     |
| Leu  | Thr | Thr | Gly | Asn | Val  | Lys   | Gly | Phe | Gly | Ala  | Gly   | Val | Tyr        | Ala | Thr |
| 465  |     |     |     |     | 470  |       |     |     |     | 475  |       |     |            |     | 480 |
| Trp  | His | Gln | Leu | Gln | Asp  | Lys   | Gln | Thr | Gly | Ala  | Tyr   | Ala | Asp        | Ser | Trp |
|      |     |     |     | 485 |      |       |     |     | 490 |      |       |     |            | 495 |     |
| Val  | Gln | Tyr | Gln | Arg | Phe  | Arg   | His | Arg | Ile | Asn  | Thr   | Glu | Asp        | Gly | Thr |
|      |     |     | 500 |     |      |       |     | 505 |     |      |       |     | 510        |     |     |
| Glu  | Arg | Phe | Thr | Ser | Lys  | Gly   | Ile | Thr | Ala | Ser  | Ile   | Glu | Ala        | Gly | Tyr |
|      |     | 515 |     |     |      |       | 520 |     |     |      |       | 525 |            |     |     |
| Asn  | Ala | Leu | Leu | Ala | Glu  |       | Val | Thr | Lys | Lys  | Gly   | Asn | Ser        | Leu | Arg |
|      | 530 |     |     |     |      | 535   |     |     |     |      | 540   |     |            |     |     |
|      | Tyr | Leu | Gln | Pro |      | Ala   | Gln | Leu | Thr |      | Leu   | Gly | Val        | Asn |     |
| 545  |     | _   | _   |     | 550  |       |     |     |     | 555  |       |     |            |     | 560 |
| Lys  | Phe | Ser | Asp |     | Glu  | Asn   | Ala | His |     | Asn  | Leu   | Leu | Gly        |     | Arg |
|      |     |     |     | 565 |      |       |     |     | 570 |      |       |     |            | 575 |     |



<210> 7 <211> 2076 <212> DNA <213> Neisseria meningitidis

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| ggaaaaggca | ataatgtgcg | gttttacctg | caaccgcagg | cgcagtttac | ctacttgggc | 1740 |
|------------|------------|------------|------------|------------|------------|------|
| gtaaacggcg | gctttaccga | cagcgagggg | acggcggtcg | gactgctcgg | cagcggtcag | 1800 |
| tggcaaagcc | gcgccggcat | tcgggcaaaa | acccgttttg | ctttgcgtaa | cggtgtcaat | 1860 |
| cttcagcctt | ttgccgcttt | taatgttttg | cacaggtcaa | aatctttcgg | cgtggaaatg | 1920 |
| gacggcgaaa | aacagacgct | ggcaggcagg | acggcgctcg | aagggcggtt | cggcattgaa | 1980 |
| gccggttgga | aaggccatat | gtccgcacgc | atcggatacg | gcaaaaggac | ggacggcgac | 2040 |
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<400> 8

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|      |            |            | 260  |      |     |             |              | 265   |            |            |            |            | 270      |             |       |
|------|------------|------------|------|------|-----|-------------|--------------|-------|------------|------------|------------|------------|----------|-------------|-------|
| Thr  | Ser        | Asp        | Asn  | Ala  | Arg | Ile         | Arg          | Leu   | Asn        | Thr        | Lys        | Asp        | Glu      | Lys         | Leu   |
|      |            | 275        |      |      |     |             | 280          |       |            |            |            | 285        |          |             |       |
| Thr  |            | His        | Lys  | Ala  | Tyr |             | Gly          | Gly   | Ala        | Asp        |            | Leu        | Phe      | Gly         | Tyr   |
| ) en | 290<br>Val | Ara        | Glu  | S0.  | Λen | 295         | Pro          | 71-   | T 0.11     | mh         | 300        | Glu        | C1-      | <b>&gt;</b> | **- 1 |
| 305  | Vai        | ALG        | GIU  | Ser  | 310 | GIU         | FIO          | WIG   | Leu        | 315        | rne        | GIU        | GIN      | ASN         | 320   |
|      | Gly        | Lys        | Ser  | Gly  |     | Val         | Leu          | Glu   | Ara        |            | Pro        | Glu        | Asn      | Leu         |       |
|      | _          | -          |      | 325  |     |             |              |       | 330        | <b>- -</b> |            |            |          | 335         | -1-   |
| Thr  | Leu        | Asp        | Gly  | Arg  | Lys | Leu         | Ile          | Ala   | Ala        | Glu        | Lys        | Ala        | Asp      | Pro         | Asn   |
|      |            |            | 340  |      |     |             |              | 345   |            |            |            |            | 350      |             |       |
| Ser  | Phe        |            | Phe  | Lys  | Gln | Asn         | Tyr          | Arg   | Gln        | Gly        | Leu        | Tyr        | Glu      | Leu         | Leu   |
| _    |            | 355        |      |      |     |             | 360          |       |            |            |            | 365        |          |             |       |
| Leu  | Lys<br>370 |            | Cys  | Glu  |     | G1y<br>375  | Phe          |       |            | Gly        |            | Gln        | Arg<br>- | Leu         | Ala   |
| Tle  |            | Glu        | Ala  |      |     |             | T.e.u        | Tur   | Δla        | Gln        | 380        | Ala        | Tu-      | פות         | ЛΙα   |
| 385  |            | 014        | 1114 | 014  | 390 | <b>v</b> a1 | Deu          | TYL   | VIG        | 395        | 3111       | Ala        | ıyı      | AIG         | 400   |
| Asn  | Thr        | Leu        | Phe  | Gly  | Leu | Arg         | Ala          | Ala   | Asp        |            | Gly        | Asp        | Asp      | Val         |       |
|      |            |            |      | 405  |     |             |              |       | 410        |            |            | _          | -        | 415         | -     |
| Ala  | Ala        | Asp        | Pro  | Ser  | Arg | Gln         | Lys          | Leu   | Trp        | Leu        | Arg        | Phe        | Ile      | Gly         | Gly   |
|      |            |            | 420  |      |     |             |              | 425   |            |            |            |            | 430      |             |       |
| Arg  | Ser        |            | Gln  | Asn  | Ile | Arg         |              | Gly   | Ala        | Ala        | Ala        | Asp        | Gly      | Arg         | Arg   |
| 7    | C1         | 435        | C1   | T1-  | C1  | G1          | 440          | **- * | <b>5</b> 1 | ,          | _          | 445        | _        | _,          |       |
| rys  | 450        | vai        | Gin  | шe   | GIĀ | 455         | GIU          | Vai   | Phe        | Val        | Arg        | Gln        | Asn      | Glu         | Gly   |
| Ser  |            | Leu        | Ala  | Ile  | Glv |             | Met          | Glv   | Glv        | Ara        | _          | Gly        | Gln      | His         | Ala   |
| 465  |            |            |      |      | 470 |             |              | ,     | 1          | 475        |            | 01,        | J        |             | 480   |
| Ser  | Val        | Asn        | Gly  | Lys  | Gly | Gly         | Ala          | Ala   | Gly        | Ser        | Tyr        | Leu        | His      | Gly         | Tyr   |
|      |            |            |      | 485  |     |             |              |       | 490        |            |            |            |          | 495         |       |
| Gly  | Gly        | Gly        | Val  | Tyr  | Ala | Ala         | Trp          | His   | Gln        | Leu        | Arg        | Asp        | Lys      | Gln         | Thr   |
|      |            |            | 500  |      |     |             |              | 505   |            |            |            |            | 510      |             |       |
| Gly  | Ala        |            | Leu  | Asp  | Gly | Trp         |              | Gln   | Tyr        | Gln        | Arg        | Phe        | Lys      | His         | Arg   |
| Tla  | Aen        | 515        | Glu  | Agn  | 7   | ת ו ת       | 520          | λ = ~ | T          | T          | m <b>.</b> | 525<br>Lys | C1       | m           | mb    |
| 110  | 530        | p          | 014  | AJII | arg | 535         | GIU          | Alg   | ıyı        | гуэ        | 540        | гуѕ        | GTA      | пр          | 1111  |
| Ala  |            | Val        | Glu  | Gly  | Gly | Tyr         | Asn          | Ala   | Leu        | Val        |            | Glu        | Glv      | Val         | Val   |
| 545  |            |            |      | _    | 550 | -           |              |       |            | 555        |            |            | 2        |             | 560   |
| Gly  | Lys        | Gly        | Asn  | Asn  | Val | Arg         | Phe          | Tyr   | Leu        | Gln        | Pro        | Gln        | Ala      | Gln         | Phe   |
|      |            |            |      | 565  |     |             |              |       | 570        |            |            |            |          | 575         |       |
| Thr  | Tyr        | Leu        |      | Val  | Asn | Gly         | Gly          |       | Thr        | Asp        | Ser        | Glu        | Gly      | Thr         | Ala   |
|      | 61         | • -        | 580  | -1   | _   |             |              | 585   |            |            |            |            | 590      |             |       |
| val  | СŢΫ        | Leu<br>595 | Leu  | GIÀ  | ser | GTA         | Gln<br>600   | Trp   | Gln        | Ser        | Arg        | Ala        | Gly      | Ile         | Arg   |
| Ala  | Lvs        |            | Ara  | Phe  | Ala | Leu         |              | Asn   | Glv        | Val        | Asn        | 605<br>Leu | Gln      | Pro         | Phe   |
|      | 610        | <b>-</b>   | · 5  |      |     | 615         | <del>y</del> |       | y          | ·          | 620        |            |          |             |       |
| Ala  | Ala        | Phe        | Asn  | Val  | Leu |             | Arg          | Ser   | Lys        | Ser        |            | Gly        | Val      | Glu         | Met   |
| 625  |            |            |      |      | 630 |             |              |       |            | 635        |            | _          |          |             | 640   |
|      |            |            |      |      |     |             |              |       |            |            |            |            |          |             |       |



Asp Gly Glu Lys Gln Thr Leu Ala Gly Arg Thr Ala Leu Gly Arg

Phe Gly Ile Glu Ala Gly Trp Lys Gly His Met Ser Ala Arg Ile Gly Gly

G650

Tyr Gly Lys Arg Thr Asp Gly Asp Lys Glu Ala Ala Leu Ser Leu Lys

G75

Tyr Leu Phe

G90

G90

Tyr Gly Lys Gly His Met Ser Ala Arg

G90

Tyr Asp Gly Asp Lys Glu Ala Ala Leu Ser Leu Lys

G85

Tyr Gly Lys Arg

Tyr Gly Lys Gly His Arg

Tyr Gly Lys A